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JOURNAL

PROJECT

INNOAIR - Innovative demand responsive green public transportation for cleaner air in urban environment

Sofia, Bulgaria

TOPIC

Air quality

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INNOAIR Final Journal

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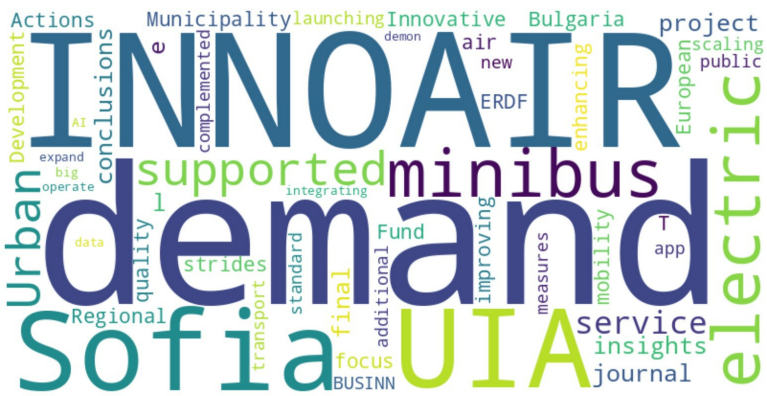

This final journal summarizes the insights and the conclusions of the INNOAIR project, led by the Municipality of Sofia, Bulgaria, and supported by the Urban Innovative Actions (UIA) under the European Regional Development Fund (ERDF). The project made significant strides in enhancing urban mobility and improving air quality, with a focus on launching and scaling an on-demand electric minibus service, complemented by three additional measures. The on-demand service, supported by the BUSINN app, set a new standard for public transport by integrating AI and big data, and continues to operate and expand, demonstrating long-term sustainability. INNOAIR also made substantial contributions to knowledge dissemination and policy development. The project's innovative solutions—on-demand transport, green corridors, congestion charges, and low emission zones—were shared with many other local and regional authorities, influencing urban mobility strategies beyond Sofia. The project played a pivotal role in shaping local policies, particularly the phased implementation of low emission zones, which will continue to evolve and help to improve Sofia's air quality. Designed for the long-term, INNOAIR's legacy is evident in both the solutions implemented and the lessons learned. The project successfully addressed key challenges related to leadership, procurement, collaboration, citizen engagement, and communication. As a pioneering initiative, INNOAIR provides a robust framework and blueprint for other cities aiming to implement sustainable, technologically advanced, and community-driven transportation solutions for better air quality.

Project's Progress

What has happened with the project since its end date

Since the conclusion of the INNOAIR project in May 2023, several key developments have occurred, reflecting the ongoing impact and scalability of the solutions implemented during the project:

- **Continuation and Scaling of On-Demand Public Transport**: The on-demand electric minibus service, initially launched in the Manastirski Livadi neighborhood of Sofia, has continued to operate beyond the project's end date. Importantly, the service has been scaled up to include three additional neighborhoods: Malinova Dolina, Vitosha, and Gorna Banya. This expansion indicates the success and sustainability of the on-demand transport model developed under INNOAIR, as it continues to meet the mobility needs of Sofia's residents.
- **Ongoing Use of the BUSINN App**: The BUSINN mobile app, which was central to the operation of the on-demand transport service, remains in use. It continues to provide residents with real-time information on bus movements, pick-up and drop-off points, and allows for flexible booking of transport services. This ongoing usage highlights the app's effectiveness in facilitating a modern, user-friendly public transport system.
- **Knowledge Dissemination and Adoption by Other Cities**: INNOAIR's legacy has extended beyond Sofia through a series of dissemination events, including webinars and an in-person workshop that coincided with the project's final conference. These events attracted significant interest from over 70 local and regional authorities, both within Bulgaria and internationally. The discussions focused on how the innovations developed in Sofia, such as on-demand transport, green corridors, congestion charges, and low emission zones, could be adopted and adapted by other cities.
- **Policy Influence and Regulatory Adjustments**: The project has influenced local policies, particularly concerning the

introduction and gradual enforcement of low emission zones (LEZ) in Sofia. The groundwork laid during INNOAIR has facilitated the ongoing implementation of these zones, which will be fully enforced in phases through 2025 and beyond. Additionally, the project's outcomes have contributed to discussions on necessary adjustments to the legal and regulatory frameworks to support the broader adoption of the innovations introduced during INNOAIR.

What is the project's plan for long-term sustainability

The INNOAIR project was designed with several strategies to ensure its long-term sustainability, namely:

- **Growth and Expansion**: The on-demand electric minibus service, initially piloted in select neighborhoods, was successfully expanded to additional areas, indicating a robust plan for scaling the service across Sofia. The continued use of the BUSINN app and integration into the city's public transport system further support its sustainability.
- **Policy and Regulatory Support**: The project laid the groundwork for lasting regulatory measures, particularly through the phased implementation of low emission zones (LEZs) and congestion charges. These policies, which extend beyond the project's end date, ensure ongoing enforcement and compliance, reinforcing the project's environmental goals.
- **Integration into Urban Mobility Strategy**: By embedding the project's innovations into Sofia's broader urban mobility framework, INNOAIR ensured continued municipal support and funding, crucial for maintaining and expanding these services.
- **Knowledge Transfer and Capacity Building**: INNOAIR focused on sharing its innovations with other cities through workshops, exchanges and dissemination events, promoting replication and broader adoption. The involvement of the National Association of Municipalities also facilitated the potential scaling of these solutions across Bulgaria.

Generated Knowledge

Lessons Learned

The INNOAIR project achieved significant milestones by implementing four key innovative solutions aimed at enhancing urban mobility and improving air quality: on-demand public transport, green corridors, congestion charges, and low emission zones. These solutions collectively contributed to Sofia's transformation into a more sustainable and livable city. The project's progress, provides valuable lessons learned that can guide similar initiatives in other cities, particularly in overcoming the seven implementation challenges typical of UIA projects: leadership, public procurement, cross-partner implementation, participation, monitoring, communication, and scaling up.

<u>On-Demand Public Transport</u>

- **Deployment of On-Demand Electric Minibuses**: The introduction of an on-demand public transport system using electric minibuses was a key innovation of INNOAIR. The AI-driven platform enabled flexible routing, tailored to real-time user requests, connecting suburban areas with Sofia's metro system. This initiative faced notable challenges in public procurement, particularly in finalizing the technical specifications for the minibuses, which highlighted the need for robust planning and early engagement with suppliers. Despite these hurdles, the project demonstrated effective leadership in accelerating the procurement process, resulting in the successful deployment of the minibuses. This experience emphasized the importance of strong leadership and strategic procurement practices in ensuring the timely delivery of complex projects.
- **Active Citizen Involvement**: The project underscored the significance of participation by actively involving Sofia's citizens in the co-creation of the on-demand transport service. Residents were engaged in determining bus routes, stops, and features of the BUSINN mobile app. However, managing diverse public opinions, especially regarding service areas and pricing, posed challenges, demonstrating that ongoing dialogue and communication are crucial for building trust and encouraging adoption. This lesson reinforced the importance of sustained citizen engagement to ensure the success of new mobility solutions.

<u>Green Corridors</u>

- **Establishment of Green Corridors**: INNOAIR's creation of green corridors highlighted the need for effective cross-partner implementation, as it required close collaboration among various municipal departments, public agencies, and technology providers. Aligning these stakeholders was essential to successfully establish infrastructure that supports sustainable mobility. The project learned that overcoming these coordination challenges was critical for implementing initiatives that span multiple sectors, emphasizing the importance of cross-departmental working in urban innovation projects.
- **Integration with Public Transport**: The project also demonstrated the value of a holistic approach to urban mobility by integrating green corridors with the on-demand transport service. The digital map developed for these corridors facilitated better planning and empowered citizens to make informed mobility choices. This experience highlighted the importance of monitoring and adjusting strategies based on real-time data and user feedback to ensure the successful integration of various mobility solutions.

<u>Congestion Charges</u>

- **Implementation of Congestion Charges**: INNOAIR's introduction of congestion charges in Sofia aimed to reduce vehicle emissions and traffic congestion, but it encountered challenges in gaining public and political support, especially during election periods. This experience highlighted the importance of communication and leadership in building broad-based support before implementing such measures. Despite these challenges, the project demonstrated that well-designed congestion charges, supported by effective communication and leadership, can significantly contribute to reducing traffic and improving air quality.
- **Public Engagement and Policy Development**: The project's experience with congestion charges underscored the necessity of

thorough public consultation and transparent communication. Engaging citizens early in the policy development process helped mitigate opposition and build a shared understanding of the benefits, emphasizing the need for proactive participation and communication strategies in implementing transformative urban policies.

Low Emission Zones (LEZ)

- **Establishment of Low Emission Zones**: The creation of LEZs in Sofia was another cornerstone of the INNOAIR project. A crucial lesson learned was the importance of phased implementation, which allowed citizens and businesses to adapt gradually to the new restrictions. However, the project also faced challenges in achieving the desired impact on emissions, particularly with less visible improvements in air quality than expected. This highlighted the need for ongoing monitoring and flexibility in policy design to adjust strategies based on real-world outcomes.
- **Impact on Air Quality**: INNOAIR's experience with LEZs demonstrated that combining regulatory measures with practical alternatives, such as on-demand transport and green corridors, was essential for maximizing impact. The project learned that scaling up these complementary measures was crucial for achieving significant improvements in air quality, underscoring the need for a comprehensive and integrated approach to urban mobility.

Recommendations for other urban authorities

The INNOAIR project, through its successful implementation of on-demand public transport, green corridors, congestion charges, and low emission zones, offers critical insights for other urban authorities aiming to launch similar innovative projects. The following recommendations, based on the lessons learned from INNOAIR's challenges and successes, can guide municipalities in enhancing urban mobility and environmental sustainability:

- **Strong Leadership and Clear Vision:** Give strong direction towards clear, shared goals and show personal dedication from the outset. For example, in the INNOAIR project, consistent leadership under leading figures of the Mayor`s office, the Transport Directorate of Sofia Municipality and the Sofia Development Association provided the stability and strategic direction needed to maintain momentum throughout the whole project duration. Even when leadership changes occurred, the project remained on course due to the solid foundations laid early on. Urban authorities should prioritize leadership continuity to prevent disruptions and ensure resilience for sustained progress.
- **Early and Strategic Public Procurement:** Plan and initiate the public procurement process early, with a focus on the specific technical requirements of innovative solutions. In the case of INNOAIR, delays in procuring the electric minibuses arose due to the sophisticated technical specifications required for the on-demand service. This experience underscored the importance of early procurement planning and close communication with suppliers to avoid delays. Urban authorities should integrate these practices into their procurement strategies to align with project timelines and technical needs.
- **Effective Cross-Partner Collaboration**: Foster strong collaboration across departments and with external partners from the start. The successful implementation of green corridors in Sofia during the INNOAIR project required close collaboration between various municipal departments, public agencies, and external partners. This experience demonstrated the necessity of aligning stakeholders through clear communication channels and shared goals. Urban authorities should establish robust frameworks for regular collaboration and problem-solving across departments and with external entities to ensure cohesive project execution.
- **Continuous Citizen Engagement and Participation:** Engage citizens early and continuously throughout the project to ensure that services meet community needs and gain public support. INNOAIR's success in designing the on-demand public transport service was largely due to the active participation of Sofia's residents, who helped tailor the service to local needs and habits. This example highlights the importance of robust citizen engagement strategies, such as public consultations, focus groups, workshops, and feedback mechanisms. Urban authorities should adopt similar approaches to co-create projects with the community, leading to higher acceptance and usage rates.
- **Robust Monitoring and Flexibility in Implementation:** Implement strong frameworks to evaluate progress and be prepared to agilely adapt strategies based on real-time data and feedback. For instance, INNOAIR's experience with low emission zones (LEZs) highlighted the need for ongoing monitoring and adaptability, as the initial impact on air quality was less than expected. This experience shows that urban authorities should establish clear key performance indicators (KPIs) and regularly review them to make data-driven adjustments, ensuring the project remains effective and relevant.
- **Proactive and Transparent Communication:** Develop a comprehensive narrative and a communication plan to inform and engage the public, stakeholders, and political leaders. In the INNOAIR project, the introduction of congestion charges faced public opposition, particularly during election periods. However, by increasing transparency and enhancing public consultation efforts, the project was able to build broader support. This example illustrates the importance of clear, consistent communication to explain the benefits of innovative measures and address public concerns effectively.
- **Scaling Up and Knowledge Transfer:** Plan for scalability from the beginning and actively share knowledge and best practices with other cities. INNOAIR's successful scaling of its on-demand minibus service to additional neighborhoods in Sofia, coupled with its efforts to disseminate knowledge through webinars and conferences, exemplifies how innovative solutions can be expanded and adopted elsewhere. Urban authorities should engage with national and international networks to share their experiences and learn from others, thereby enhancing the overall impact of their projects.

Conclusions

The expert's final reflection on the project

Reflecting on the entirety of the INNOAIR project, it is evident that this project has had a profound impact on transforming urban mobility in Sofia and beyond. The successful launch of the on-demand electric minibus service stands as a testament to the project's innovative approach to public transport, significantly enhancing urban mobility while contributing to improved air quality. What truly sets INNOAIR apart is its unwavering commitment to co-designing solutions with citizens, ensuring that the services developed align with the needs and expectations of the community. This deep level of community engagement, combined with the integration of advanced technologies like AI and big data for service optimization and a smartphone app for bookings, marks INNOAIR as a pioneering initiative in urban transportation.

In recent years, several attempts to develop on-demand public transport have been made across the EU and beyond, but few have achieved the level of service quality and continuity demonstrated by INNOAIR. The project's success can be largely attributed to the strong vision and dedication of the Municipality of Sofia, along with its agencies and partners in universities and companies. The seamless integration of digital, electric minibuses into the existing public transportation and maintenance infrastructure, e.g. the TRAMKAR depots for re-charging, further underscores the effectiveness of this initiative.

Moreover, INNOAIR's comprehensive approach to improving air quality through a combination of push and pull measures—such as green corridors, congestion charges, and low emission zones—makes this project truly unique. It goes beyond the introduction of on-demand buses to create a holistic system that addresses urban transport challenges and potentially will improve the air quality in one of Europe's most polluted cities from multiple angles. INNOAIR stands as a blueprint for cities aiming to embrace sustainable transportation solutions that are both technologically advanced and deeply rooted in community collaboration.

Legacy of the project

The INNOAIR project leaves a significant legacy both in terms of the innovative solutions it implemented and the valuable knowledge it generated. At its core, INNOAIR successfully demonstrated how a city can transition towards more sustainable urban mobility by integrating cutting-edge technology with active citizen engagement. The project's main solution—an AI-enabled, app-supported on-demand electric minibus service—pioneered a flexible and environmentally friendly public transport option that can adapt to real-time user demands. This approach not only improved connectivity between suburban areas and the metro system in Sofia but also set a new standard for public transport systems in urban environments.

In addition to the on-demand transport service, INNOAIR implemented green corridors, congestion charges, and low emission zones, creating a comprehensive framework for reducing urban emissions and promoting sustainable mobility. These solutions, when combined, demonstrated how regulatory measures, infrastructure development, and technological innovation can work together to significantly improve air quality and urban livability.

The knowledge generated through INNOAIR is equally impactful. The project highlighted the importance of early and strategic planning, particularly in areas such as public procurement and cross-departmental collaboration. It also underscored the need for continuous citizen engagement to ensure the success of innovative solutions, as well as the critical role of flexible monitoring and adaptation processes. Furthermore, INNOAIR's proactive communication strategies and its efforts to scale up and share its innovations provide a valuable blueprint for other cities.

In essence, INNOAIR's legacy is a blend of practical, scalable solutions and a rich repository of lessons learned that can guide future urban mobility projects. The project not only transformed Sofia's approach to public transport but also contributed to the broader discourse on sustainable urban development, offering insights and models that can be replicated across cities in Europe and beyond.

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